	Application No.	Applicant(s)
Notice of Allowability	09/541,631	BALKANY, ALAN
	Examiner	Art Unit	
	Baoquoc N. To	2162	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to _____.

2. ☒ The allowed claim(s) is/are *33-37 and 39-53*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some*   c) ☐ None of the:

        1. ☐ Certified copies of the priority documents have been received.

        2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

        3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

    * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.

    (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached

        1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____ .

    (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of

        Paper No./Mail Date _____ .

    Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)

2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)

3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____

4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material

5. ☐ Notice of Informal Patent Application (PTO-152)

6. ☒ Interview Summary (PTO-413), Paper No./Mail Date *06/24/2006* .

7. ☒ Examiner's Amendment/Comment

8. ☒ Examiner's Statement of Reasons for Allowance

9. ☐ Other _____ .

DETAILED ACTION

1.   Claims 33-34, 39 and 43 are amended, claim 38 is canceled and claim 53 are

newly added in the amendment filed on 06/19/2006.

Claims 33-37 and 39-53 are pending in this application.

EXAMINER'S AMENDMENT

2.   An examiner's amendment to the record appears below. Should the changes

and/or additions be unacceptable to applicant, an amendment may be filed as provided

by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be

submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview

with Alan Balkany on 06/23/06.

The application has been amended as follows:

33. (CURRENTLY AMENDED) A computer-implemented method for improving

compression for storage of a plurality of parallel data element sequences comprising:

(a) Creating one or more <u>dictionaries</u> of unique values for each of said data element

sequences, wherein ~~each~~ said ~~dictionary~~ <u>one or more dictionaries</u> ~~associates~~

<u>associate(s)</u> a numeric index with each unique value,

(b) forming an n-ary tree with leaf and interior nodes wherein:

(1) each said leaf node corresponds to one of said <u>one or more</u> dictionaries,

(2) each said interior node associates a numeric index with tuples of numeric

indexes from other subordinate leaf or interior nodes,

(3) one or more interior nodes store one or more sequences of mutually-

consecutive tuples by representing said sequences in a form that uses less

storage space than representing said sequences as individual tuples, and

(4) one or more interior nodes perform at least one of:

    i. record the addition of a tuple that extends a tuple sequence by modifying

       one or more fields in the representation of said sequence that are capable

       of representing the length of said sequence, or

    ii. record the addition of a tuple that invalidates an existing tuple sequence

       by splitting said tuple sequence into one or more subsequences, wherein

       none of the tuples of said subsequences contain any element of said

       added tuple, or

    iii. record the addition of a tuple that has not been previously added to said

       interior node, wherein said added tuple does not extend a tuple sequence,

       by adding said tuple to a tuple collection, <u>and</u>

wherein the forming step ~~comprises~~ <u>defines</u>:

~~defining~~ a problem space comprising:

    (1) a set of states<u>,</u> ~~such that~~ <u>wherein</u> each said state contains an n-ary tree

       design, <u>said design</u> comprising a set of leaves and zero or more interior

       nodes,<u>wherein</u> each said interior node ~~with~~ <u>contains</u> zero or more other

       nodes as children, and

(2) a value function, giving a numeric ranking of the value of any state's n-ary

tree design, wherein said numeric ranking is used to either perform at least

one of:

a   determine if said state's n-ary tree design is acceptable, or

b   rank the n-ary tree designs of states that can be reached reachable by

applying operators to a state, to select an operator,

defining one or more operators that transform one state to another, and

searching said problem space, starting from an initial state and applying

operators to move to other states until a state with an acceptable n-ary tree design is

reached.

39. (CURRENTLY AMENDED) A computer-implemented method for improving

compression for storage of a plurality of parallel data element sequences comprising:

(a) creating a one or more dictionary dictionaries of unique values for each of said

data element sequences, wherein each said one or more dictionary dictionaries

associates associate(s) a numeric index with each unique value,

(b) forming one or more n-ary trees with leaf and interior nodes wherein:

(1) at least one of said leaf nodes is distinct from, and represents a subset of

values from one of said dictionaries,

(2) each interior node associates a numeric index with tuples of numeric indexes

from other subordinate leaf or interior nodes,

wherein the forming step comprises defines:

~~defining~~ a problem space comprising:

> (1) a set of states, ~~such that~~ wherein each said state contains an n-ary tree
>
> design, said design comprising a set of leaves and zero or more interior
>
> nodes, wherein each said interior node ~~with~~ contains zero or more other
>
> nodes as children, and
>
> (2) a value function, giving a numeric ranking of the value of any state~~'s~~ n-ary
>
> tree design, wherein said numeric ranking is used to ~~either~~ perform at least
>
> one of:
>
> > a. determine if said state's n-ary tree design is acceptable, or
> >
> > b. rank the n-ary tree designs of states ~~that can be reached~~ reachable by
> >
> > applying operators to a state, to select an operator,
>
> defining one or more operators that transform one state to another, and
>
> > searching said problem space, starting from an initial state and applying
>
> operators to move to other states until a state with an acceptable n-ary tree
>
> design is reached.

43. (CURRENTLY AMENDED) A computer-implemented method for storage of a

plurality of parallel data element sequences, and efficiently processing elements

from a subset of said sequences, comprising:

(a) creating ~~a~~ one or more ~~dictionary~~ dictionaries of unique values for each of said

> data element sequences, wherein ~~each~~ said one or more ~~dictionary~~ dictionaries
>
> ~~associates~~ associate(s) a numeric index with each unique value,

(b) forming one or more n-ary trees with leaf and interior nodes wherein:

   (1) each leaf node corresponds to one of said <u>one or more</u> dictionaries,

   (2) each interior node associates a numeric index with tuples of numeric indexes from other subordinate leaf or interior nodes,

   (3) a gate field is defined for one or more interior nodes,

(c) processing the leaves corresponding to said subset of sequences by:

   (1) setting the value of said gate field for each said interior node, to indicate which of said interior node's branches lead to leaf nodes in said subset,

   (2) following paths that lead to said leaf nodes, and

   (3) processing said elements in said leaf nodes encountered,

wherein the forming step ~~comprises~~ <u>defines</u>:

   ~~defining~~ a problem space comprising:

   (1) a set of states<u>,</u> ~~such that~~ <u>wherein</u> each said state contains an n-ary tree design, <u>said design</u> comprising a set of leaves and zero or more interior nodes, each said interior node ~~with~~ <u>contains</u> zero or more other nodes as children, and

   (2) a value function, giving a numeric ranking of the value of any state<u>'</u>s n-ary tree design, wherein said numeric ranking is used to ~~either~~ <u>perform at least one of</u>:

      a. determine if said state<u>'</u>s n-ary tree design is acceptable, or

      b. rank the n-ary tree designs of states ~~that can be reached~~ <u>reachable</u> applying operators to a state, to select an operator,

defining one or more operators that transform one state to another, and

searching said problem space, starting from an initial state and applying

operators to move to other states until a state with an acceptable n-ary tree design is

reached.

Allowable Subject Matter

3.   Claims 33-37 and 39-53 are allowed over prior art made of record.

The following is an examiner's statement of reasons for allowance:

As to claim 33, none of the known prior art alone or in combination either teaches for

suggest "wherein the forming step comprises: defining a problem space comprising:

(1) a set of states such that wherein each said state contains an n-ary tree design,

comprising a set of leaves and zero or more interior nodes, each said interior node

with zero or more other nodes as children, and (2) a value function, giving a numeric

ranking of the value of any state's n-ary tree design, wherein said numeric ranking is

used to either perform at least one of: determine if said state's n-ary tree design is

acceptable, or rank the n-ary tree designs of states that can be reached reachable

by applying operators to a state, to select an operator, defining one or more

operators that transform one state to another, and searching said problem space,

starting from an initial state and applying operators to move to other states until a

state with an acceptable n-ary tree design is reached" in conjunction with "(a)

creating a dictionary of unique values for each of said data element sequences,

wherein each dictionary associates a numeric index with each unique value, (b)

forming an n-ary tree with leaf and interior nodes wherein: each said leaf node

corresponds to one of said dictionaries, each said interior node associates a numeric

index with tuples of numeric indexes from other subordinate leaf or interior nodes,

one or more interior nodes store one or more sequences of mutually-consecutive

tuples by representing said sequences in a form that uses less storage space than

representing said sequences as individual tuples, and one or more interior nodes

perform at least one of: i. record the addition of a tuple that extends a tuple

sequence by modifying one or more fields in the representation of said sequence

that are capable of representing the length of said sequence, or ii. record the

addition of a tuple that invalidates an existing tuple sequence by splitting said tuple

sequence into one or more subsequences, wherein none of the tuples of said

subsequences contain any element of said added tuple, or iii. record the addition of

a tuple that has not been previously added to said interior node, wherein said added

tuple does not extend a tuple sequence, by adding said tuple to a tuple collection."

Claims 34-37 are depended on claim 33; therefore, claim 34-37 are allowed

under the same reason as to claim 33.

Claim 39 is a method which has the same allowable feature as to claim 33;

therefore, claim 39 is allowed under the same reason as to claim 33.

Claims 40-42 are depended on claim 39; therefore, claims 40-42 are allowed

under the same reason as to claim 39.

Claims 43 is a method which has the same allowable feature as to claim 33;

therefore, claim 43 is allowable under the same reason as to claim 33.

Claims 44-53 are depended on claim 43; therefore, claims 44-53 are allowed

under the same reason as to claim 43.

Any comments considered necessary by applicant must be submitted no later

than the payment of the issue fee and, to avoid processing delays, should preferably

accompany the issue fee. Such submissions should be clearly labeled "Comments on

Statement of Reasons for Allowance."

Conclusion

4.   The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure.

Patent Number:

Fujihara   (US. Patent No. 5,778,371)   Patent date: 07/07/1998.

Steele et al. (US. Pub. No. US 2002/0091700 A1)   Patent date: 07/11/2002.

Satoh et al. (US. Patent No. 6,529,912 B2)   Patent date: 03/04/2003.

NPL:

Nomoto et al. Supervised ranking in open-domain text summarization, Annual

Meeting of the ACL, 2001, pages 465-472.

Gope et al. Fast full-wave EFIE solution by low-rank compression of Multilevel

Predetermined Sub-Matrices, Antenas and Propagation Society International

Symposium, July 3-8, 2005, pages 184-187.

Tsay et al. Data compression on multifont Chinese character pattern, Image

Processing, March 1994, Pages 139-146.

Gruter et al. Rank-order polynomial subband decomposition for medical image compression, Medical Imaging, IEEE transactions, Oct. 2000, pages 1044-1052.

Sadakane K. Text compression using recency rank with context and relation to context sorting, block sorting and PPM, Compression and complexity of Sequences 1997, June 11-13, 1997, pages 305-319.

Contact Information

5.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Baoquoc N. To whose telephone number is at 571-272-4041 or via e-mail BaoquocN.To@uspto.gov. The examiner can normally be reached on Monday-Friday: 8:00 AM – 4:30 PM, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Breene can be reached at 571-272-4107.
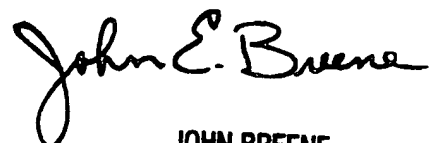
Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Any response to this action should be mailed to:
          Commissioner of Patents and Trademarks
          Washington, D.C. 20231.

The fax numbers for the organization where this application or proceeding is assigned are as follow:
          (571) –273-8300   [Official Communication]

BQ To
June 24th, 2006

JOHN BREENE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100